OPERATING

INSTRUCTION MANUAL

TRANSISTORIZED RADIOTELEPHONES

MODELS

CN414-2 CN438-2 CN495-2

CANADIAN MARCONI COMPANY
2442 Trenton Avenue
Montreal 16,
Province of Quebec
CANADA

IN U.S.A.
RADIO ELCOM CORPORATION
A Subsidiary of Canadian Marconi Company
232 Wescott Drive
Rahway, N.J.

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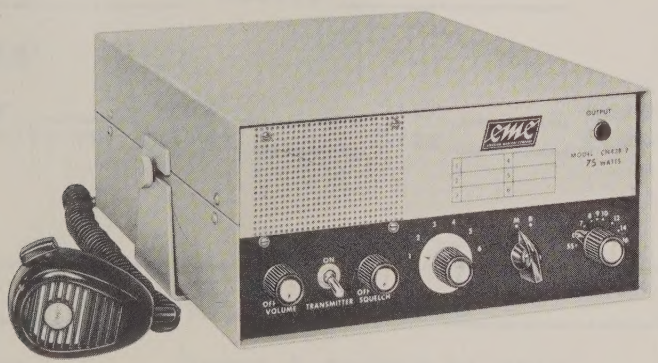
INSTALLATION AND OPERATING INSTRUCTIONS



INSTALLATION CHECK LIST

MODEL NO. _____ SERIAL NO. _____

DATE PURCHASED _____ DATE INSTALLED _____

DEALER'S NAME _____

INSTALLING TECHNICIAN _____ LICENSE _____

TO BE ASSURED OF A PROPER INSTALLATION, MAKE CERTAIN THAT THE INSTALLING TECHNICIAN HAS PERFORMED ALL OF THE FOLLOWING STEPS APPLICABLE TO YOUR UNIT.

PRIMARY LEADS:

DIRECT TO BATTERY _____
TO TERMINAL BOX _____
WIRE SIZE _____ LENGTH _____

GROUND SYSTEM:

GROUND PLATE _____ TYPE _____ SIZE _____ MOUNTED _____
COPPER SHEETING OR TUBING _____ SIZE _____ LENGTH _____ INSTALLED ____

ANTENNA:

TYPE _____ SIZE _____

LEAD IN _____ FT. TYPE WIRE _____ LENGTH WIRE _____

WIRE ROUTING: _____ SHORT & DIRECT TO UNIT
_____ ISOLATED FROM ALL OTHER WIRING
_____ ISOLATED FROM LARGE AREAS OF METAL

BATTERIES:

NUMBER _____ TYPE _____
VOLTAGE MEASURED AT TRANSCEIVER WITH ENGINE OFF _____
VOLTAGE MEASURED AT TRANSCEIVER WITH ENGINE ON _____

NOISE SUPPRESSION:

_____ CONDENSER INSTALLED ON ARMATURE SIDE OF GENERATOR
_____ CONDENSER INSTALLED ON SWITCH SIDE OF IGNITION COIL
_____ CONDENSER INSTALLED ON BATTERY SIDE OF VOLTAGE REGULATOR
_____ SUPPRESSOR AND IGNITION COIL LEADS, DRESSED CLOSE TO COIL

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INSTALLATION CHECK LIST CONTINUED ....

TRANSMITTER TUNING:

_____ NUMBER OF CHANNELS CHECKED
_____ METER READING OF ONE CHANNEL ONLY (2182 KC/S)
_____ PLATE TANK DIPPED FOR MINIMUM PLATE CURRENT
_____ ANTENNA LOADING COIL RESONATED FOR MAXIMUM ANTENNA CURRENT
_____ LOADING CAPACITORS ADJUSTED FOR PROPER LOADED PLATE CURRENT

RECEIVER TUNING:

_____ NUMBER OF CHANNELS TUNED
_____ TRIMMERS PROPERLY TUNED TO SIGNAL AND NOT TO IMAGE

REMARKS:

INTRODUCTION

YOUR MODEL CN414-2, CN438-2 OR CN495-2 RADIOTELEPHONE HAS BEEN CAREFULLY DESIGNED FOR DEPENDABLE AND RELIABLE COMMUNICATIONS; BUILT BY CRAFTSMEN, USING ONLY QUALITY COMPONENTS. THIS EQUIPMENT IS RUGGEDLY CONSTRUCTED AND IS IN FACT BEING USED UNDER ALL TYPES OF CLIMATIC CONDITIONS, FROM THE ARTIC TO THE TROPICS. HOWEVER, PLEASE REMEMBER, IT IS A PRECISION INSTRUMENT AND SHOULD BE TREATED AS SUCH.

THIS IS A TRANSISTORIZED RADIOTELEPHONE PACKAGE AND IS READY FOR INSTALLATION AND OPERATION. IN DESIGNING THIS EQUIPMENT, PARTICULAR ATTENTION HAS BEEN GIVEN TO THE PRACTICAL AND SENSIBLE USE OF TRANSISTORS, TO ASSURE THE OWNER OF AN UNUSUALLY DURABLE, EFFICIENT AND LIGHTWEIGHT UNIT.

THE PACKAGE CONTAINS BOTH TRANSMITTER AND RECEIVER, WHICH ARE CRYSTAL CONTROLLED. THE TRANSMITTER USES A PI-TYPE NETWORK TO THE ANTENNA. SEPARATE VARIABLE COUPLING CAPACITORS ARE PROVIDED FOR EACH CHANNEL, PERMITTING UNIFORM LOADING AND ANTENNA COUPLING FOR EACH CHANNEL THAT IS TO BE USED. THIS RESULTS IN OPTIMUM EFFICIENCY OF OPERATION AT EACH CHANNEL. THE MODULATOR STAGE INCORPORATES A NEGATIVE PEAK CLIPPING CIRCUIT AS WELL AS AN AUDIO FILTER THAT ATTENUATES FREQUENCIES ABOVE 3000 CYCLES. IN THIS WAY THE MAXIMUM "TALK-POWER" IS RADIATED IN THE USEFUL FREQUENCIES, ADJACENT TO THE CARRIER FREQUENCY.

LOCATION OF EQUIPMENT

IN SELECTING A LOCATION FOR YOUR RADIOTELEPHONE, THE FOLLOWING POINTS SHOULD BE CONSIDERED:

A - EASY ACCESSIBILITY FOR COMPLETE OPERATION AND MAINTENANCE

B - ASSURANCE OF SHORTEST POSSIBLE LEADS TO GROUND

C - MINIMAL HORIZONTAL ANTENNA LEAD-IN

D - BATTERY LEADS SHOULD BE HEAVY ENOUGH TO MAINTAIN FULL INPUT VOLTAGE. LONGER LEADS PRESENT RESISTANCE WHICH LOWERS BATTERY OUTPUT TO THE RADIOTELEPHONE

E - THE RADIOTELEPHONE SHOULD BE INSTALLED IN A PROTECTED AREA

A SEPARATE MICROPHONE HANGER IS PROVIDED TO PERMIT PLACEMENT OF THE MICROPHONE AT A CONVENIENT LOCATION.

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OPERATION

RECEIVING:

TURN THE VOLUME CONTROL POWER SWITCH ON; SET THE VOLUME CONTROL TO THE DESIRED LEVEL AND SET THE CHANNEL SELECTOR SWITCH TO THE DESIRED CHANNEL. THE AUTOMATIC NOISE LIMITER CIRCUIT IS PUT INTO OPERATION AS SOON AS THE SQUELCH CONTROL IS IN THE ON POSITION. NOISE LIMITER AND SQUELCH AFFECT ALL CHANNELS, INCLUDING THE BROADCAST POSITION. TO ADJUST THE SQUELCH, ADVANCE CONTROL IN A CLOCKWISE DIRECTION UNTIL THE RECEIVER IS QUIETED.

TRANSMITTING:

TO COMPLY WITH F.C.C. AND D.O.T. REGULATIONS, ALL CALLS MUST BE MADE BY STARTING ON THE INTERNATIONAL CALLING FREQUENCY OF 2182 KC/S, THEN TRANSFERRING TO A WORKING FREQUENCY AFTER CONTACT HAS BEEN MADE WITH THE VESSEL OR STATION BEING CALLED. THE TRANSMITTER FILAMENTS ARE TURNED ON BY SWITCHING THE TRANSMITTER SWITCH TO THE ON POSITION, THIS WILL LIGHT UP THE GREEN PANEL BULB. THE TUBES SHOULD BE ALLOWED TO WARM UP FOR AT LEAST 20 SECONDS. PRESS THE BUTTON ON THE MICROPHONE WHEN YOU WISH TO TALK AND RELEASE THE BUTTON WHEN YOU WISH TO LISTEN. THE RED INDICATOR LIGHT ON THE UPPER RIGHT CORNER OF THE PANEL WILL INDICATE ANTENNA CURRENT. THE BRILLIANCY OF THE LIGHT WILL VARY AS YOU SPEAK INTO THE MICROPHONE. ON THE LARGER UNITS AN RF METER INDICATOR IS PROVIDED INSTEAD OF THE RED LIGHT TO MONITOR THE AMOUNT OF ANTENNA CURRENT.

WHEN ONLY MONITORING 2182 KC/S, KEEP THE TRANSMITTER SWITCH IN THE OFF POSITION, TO CONSERVE BATTERY POWER.

PREVENTIVE MAINTENANCE

1. IF POSSIBLE, KEEP RADIOTELEPHONE COVERED WITH PLASTIC SHEETING, WHEN SET IS NOT IN USE.

2. KEEP SHIP BATTERIES FULLY CHARGED.

3. WASH DOWN ANTENNA WITH FRESH WATER AND CLEAN DRY.

4. PERIODICALLY INSPECT ANTENNA CONNECTIONS. KEEP THESE TIGHT AND FREE FROM CORROSION.

5. DO NOT PLACE METALLIC OBJECTS IN BACK OF THE EQUIPMENT. THE TRANSISTORS ON THE REAR PANEL MIGHT THUS BECOME SHORTED AND RENDER THE TRANSCEIVER INOPERATIVE.

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INSTALLATION INSTRUCTIONS

PRELIMINARY INFORMATION - FOR THE TECHNICIAN

YOUR TRANSISTORIZED RADIOTELEPHONE OPERATES FROM 12 VOLTS DC ONLY. INPUT POLARITY MUST BE OBSERVED FOR PROPER OPERATION, BUT NO DAMAGE WILL RESULT IF THE LEADS ARE ACCIDENTALLY REVERSED. MINIMUM OPERATING VOLTAGE IS 11 VOLTS AND MAXIMUM IS 16 VOLTS. HIGHER VOLTAGES CAN CAUSE PERMANENT DAMAGE TO THE UNIT.

THE LEADS FROM THE POWER SOURCE SHOULD BE OF SUFFICIENT SIZE TO CARRY THE CURRENT WITH AS LITTLE VOLTAGE DROP AS PRACTICAL. THE RECOMMENDED WIRE SIZES FOR THE 30 - 50 - 75 WATT, 12 VOLT SETS ARE AS FOLLOWS:

DISTANCE FROM BATTERY	WIRE SIZE
5 FEET OR LESS	No. 10
5 TO 10 FEET	No. 6
10 TO 20 FEET	No. 4

THE RECOMMENDED WIRE SIZES FOR THE 110 AND 150 WATT, 12 VOLT SETS ARE:

5 FEET OR LESS	No. 7
5 TO 10 FEET	No. 4
10 TO 20 FEET	No. 2

NOTE: IF THE RECOMMENDED SIZES ARE NOT AVAILABLE, THE HEAVIEST WIRE OBTAINABLE CAN BE TIED IN PARALLEL. FOR EXAMPLE, IF No. 2 WIRE IS NOT HANDY, TWO No. 4 WIRES CAN BE PARALLELED TO OBTAIN MAXIMUM CURRENT WITH LOW VOLTAGE LOSSES.

THE BATTERY INPUT CIRCUIT OF THE TRANSISTORIZED RADIOTELEPHONE IS ISOLATED FROM GROUND AND CAN BE GROUNDED NEGATIVE, POSITIVE, OR LEFT FLOATING AS YOUR INSTALLATION MAY REQUIRE, PROVIDING THE UNIT IS GROUNDED AT THE CHASSIS GROUND TERMINAL AT THE BACK OF THE SET.

THE RADIOTELEPHONE SHOULD BE LOCATED WITH CONSIDERATION GIVEN TO THE GROUND CIRCUIT AND LOCATION OF THE ANTENNA. IT IS BEST TO PLACE THE TRANSMITTER SO THE FIVE FOOT LEAD-IN SUPPLIED, IS ADEQUATE TO REACH THE ANTENNA TERMINAL ON THE REAR OF THE CABINET. THIS LEAD-IN SHOULD BE WELL INSULATED FROM GROUNDED POINTS ON THE BOAT, SINCE THE VOLTAGE ON THE LOWEST FREQUENCIES IS HIGH AT THIS POINT.

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INSTALLATION INSTRUCTIONS CONTINUED .....

A GOOD RADIO GROUND IS REQUIRED. METAL HULL BOATS FURNISH THE BEST GROUND. COMMERCIAL BOATS SHOULD HAVE AN AUXILIARY GROUND SYSTEM OF COPPER SHEETING (26 GAUGE OR BETTER) COVERING AN AREA OF AT LEAST 12 SQUARE FEET. IN FRESH WATER, THE GROUND SYSTEM AREA SHOULD BE INCREASED TO 15 TO 30 SQUARE FEET. THE ARTIFICIAL GROUND CAN BE INSTALLED ON THE OUTSIDE OR INSIDE OF THE HULL, BELOW THE WATER LINE. FOR PLEASURE BOAT INSTALLATIONS, GROUND PLATES (COMMERCIALLY AVAILABLE) WILL PROVE ADEQUATE. THE LEAD FROM THE TRANSCEIVER CHASSIS TO GROUND SHOULD CONSIST OF COPPER SHEETING (20 OR 24 GAUGE) 1-1/2" TO 2" WIDE. ANOTHER CHOICE IS BRAIDED GROUND STRAP. THESE CAN BE PURCHASED FROM ELECTRICAL SUPPLY HOUSES.

BEFORE BEING RELEASED FROM THE FACTORY, ALL RADIOTELEPHONES ARE COMPLETELY TESTED AND INSPECTED ON ALL CHANNELS. TRANSMITTER ADJUSTMENTS ARE MADE INTO A 10 OHM NON-INDUCTIVE DUMMY LOAD.

IN THE U.S.A. ALL TRANSMITTER TUNING ADJUSTMENTS MUST BE PERFORMED BY AN F.C.C. LICENSED TECHNICIAN.

TRANSMITTER:

1. ALIGNMENT:

TO ADJUST THE TRANSMITTER, DISCONNECT THE ANTENNA AND PLACE THE CHANNEL SELECTOR SWITCH ON CHANNEL 1. PLUG IN AN 0-250 MILLIAMPERE METER TO THE METER JACK MARKED PA CATHODE. THE LOAD ADJUSTING TRIMMERS FOR THE TRANSMITTER ARE MARKED PA LOAD 1, 2, 3, ETC., WITH AN ADDITIONAL ALL-CHANNEL TRIMMER CALLED LOAD RANGE.

IF PA TANK TUNING CONDENSERS ARE PROVIDED, ADJUST THE LATTER TO APPROXIMATELY HALF CAPACITY BEFORE MAKING THE FOLLOWING ADJUSTMENTS:

MODEL CN414-2	25 - 30 MA
MODEL CN438-2	30 - 40 MA
MODEL CN495-2	40 - 65 MA

BEGINNING AT THE HIGH INDUCTANCE END, SLIDE TANK COIL CLIP ALONG COIL UNTIL THE PA CATHODE METER READS MINIMUM. MINIMUM SHOULD BE WITHIN LIMITS SHOWN ABOVE. IF A PA TANK CONDENSER IS PROVIDED, A FURTHER REFINEMENT IN THE DIP CAN BE MADE.

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INSTALLATION INSTRUCTIONS CONTINUED ....

TRANSMITTER:

1. ALIGNMENT: CONTINUED ....

ALWAYS TIGHTEN CLIPS AFTER LOCATING THE PROPER SETTING, AND SLIDE THE INSULATING SLEEVING TIGHTLY AGAINST THE COIL TO PREVENT SHORTING. REPEAT THIS PROCEDURE FOR EACH CHANNEL.

BEGIN WITH THE LOWEST FREQUENCY CHANNELS AND CONTINUE UP TO AND INCLUDING THE HIGHEST FREQUENCY TO MINIMIZE THE INTERACTION BETWEEN THE VARIOUS ADJUSTMENTS. A FURTHER REFINEMENT OF THE DIP CAN BE ACCOMPLISHED ON CHANNELS WHICH ARE SUPPLIED WITH A TANK TUNING CONDENSER.

THE TANK COIL AND LOADING COIL CLIPS ARE COLOUR CODED IN ACCORDANCE WITH RMA STANDARDS, WHICH ARE SHOWN IN THE LIST BELOW:

CHANNEL 1 - BROWN		CHANNEL 5 - GREEN	
CHANNEL 2 - RED		CHANNEL 6 - BLUE	
CHANNEL 3 - ORANGE		CHANNEL 7 - VIOLET	
CHANNEL 4 - YELLOW		CHANNEL 8 - GREY	

SINCE HIGH RF VOLTAGES EXIST IN THE PLATE TANK CIRCUIT, EXTREME CARE SHOULD BE EXERCISED IN MAKING THE ADJUSTMENTS. ALWAYS HANDLE CLIP LEADS BY THE INSULATED PORTION OF THE WIRE.

2. ANTENNA LOADING AND COUPLING:

TO TUNE THE ANTENNA FOR RESONANCE AND TO SET THE ANTENNA COUPLING FOR THE PROPER AMPLIFIER CURRENT, PROCEED AS FOLLOWS:

STEP 1: CONNECT THE ANTENNA.

STEP 2: SET THE CHANNEL SELECTOR SWITCH ON THE CHANNEL FOR THE HIGHEST FREQUENCY TO BE USED.

STEP 3: SLIDE THE ANTENNA COIL CLIP ALONG THE ANTENNA LOADING COIL FOR MAXIMUM ANTENNA CURRENT WHICH WILL BE INDICATED BY A MAXIMUM READING ON THE PA CATHODE METER AND ALSO ON THE INDICATOR LAMP OR RF METER ON THE FRONT PANEL. IF THE PA CATHODE CURRENT IS TOO HIGH OR TOO LOW, VARY THE ANTENNA LOADING CAPACITOR TO BRING THE PA CATHODE CURRENT TO ITS PROPER LEVEL AS INDICATED BELOW:

CONTINUED 8

INSTALLATION INSTRUCTIONS CONTINUED ....

TRANSMITTER:

2. ANTENNA LOADING AND COUPLING: CONTINUED ....

MODEL CN412-2	75 - 85 MA
MODEL CN438-2	105 - 120 MA
MODEL CN495-2	200 - 220 MA

NOTE: IF DURING THE ADJUSTMENT OF ANY CHANNEL IT BECOMES NECESSARY TO READJUST THE LOAD RANGE CONTROL, THE PA LOAD CONTROL SETTING FOR ALL OTHER CHANNELS WHICH MAY HAVE BEEN COMPLETED WILL BE AFFECTED.

STEP 4: RECHECK THE ACCURACY OF THE PA TANK TUNING BY DISCONNECTING THE ANTENNA TO SEE IF THE TANK IS STILL DIPPED.

STEP 5: REPEAT THIS PROCEDURE FOR THE REMAINING CHANNELS TO BE USED (IN STEPS, HIGHEST FREQUENCY FIRST, DECREASING TO THE LOWEST FREQUENCY).

STEP 6: CHECK THE MODULATION BY NOTING THE INCREASE OF ANTENNA CURRENT AS SHOWN BY THE FRONT PANEL METER OR BY THE BRILLIANCY OF THE RED INDICATING LIGHT, WHILE SPEAKING IN A NORMAL TONE INTO THE MICROPHONE. THE CURRENT SHOULD RISE FROM 15 TO 25% ON THE STRONGEST VOICE PEAKS.

THE MIC. GAIN IS FACTORY SET FOR AVERAGE CONDITIONS. IN SOME RADIOTELEPHONES AN ADJUSTABLE MIC. GAIN CONTROL IS PROVIDED WHICH SHOULD BE CHANGED ONLY IF THE OPERATOR'S MICROPHONE HABITS OR HIGH NOISE LEVEL REQUIRE IT. IN PRACTICE, THE UNIT IS VERY TOLERANT OF LARGE VARIATIONS IN THE MICROPHONE LEVEL BECAUSE OF THE HIGH AUDIO GAIN COUPLED WITH THE USE OF THE MODULATION LIMITING CIRCUIT AND EFFECTIVE AUDIO "SPLATTER FILTER".

NOTE: FOR TROUBLE SHOOTING, SEE SERVICE NOTES.

INITIAL RECEIVER TUNE-UP:

1. CRYSTAL FREQUENCY - DESIRED FREQUENCY PLUS 455 KC/S.

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INSTALLATION INSTRUCTIONS CONTINUED ....

INITIAL RECEIVER TUNE-UP: CONTINUED ....

2. ALIGNMENT PROCEDURE:

THE RECEIVER TUNING RANGE IS FUNDAMENTALLY 2 MC/S TO 6 MC/S, UNLESS OTHERWISE STATED. ALL RECEIVERS ARE FACTORY PRETUNED ON ALL CHANNELS. TO RETUNE THE RECEIVER, USE A VOM (20,000 OHMS PER VOLT) TO MEASURE AVC VOLTAGE AT TEST POINT. COUPLE THE SIGNAL GENERATOR THROUGH A 200 pF CONDENSER TO THE ANTENNA JACK. SET THE SIGNAL GENERATOR FREQUENCY TO THE DESIRED OPERATING FREQUENCY, KEEPING IN MIND, THAT THE CRYSTAL FREQUENCY IS THE OPERATING FREQUENCY PLUS 455 KC/S. TUNE THE RECEIVER TRIMMERS FOR A MAXIMUM READING ON THE VOM WHILE MAINTAINING A LEVEL FROM THE GENERATOR WHICH IS JUST SUFFICIENT TO GIVE A GOOD PEAKING INDICATION ON THE VOM. REPEAT THIS PROCEDURE ON ALL CHANNELS WHERE RETUNING IS REQUIRED.

R.F. ALIGNMENT:

ADJUST RECEIVER TRIMMERS 1/2 TO ONE TURN FROM FULLY CLOCKWISE POSITION AND PEAK MARINE RECEIVER COILS AT LOWEST FREQUENCY TO BE USED.

THE ADJUSTING TRIMMERS FOR EACH RECEIVER CHANNEL ARE LOCATED AT THE TOP OF THE CHASSIS IN THE SECTION MARKED REC. THEY CAN BE ADJUSTED FROM THE TOP OF THE CHASSIS AND ARE MARKED 1, 2, 3, ETC. WITH THE CHANNEL SELECTOR SWITCH ON THE FIRST CHANNEL TO BE TUNED, PEAK THE RECEIVER, ADJUSTING THE TRIMMER MARKED 1 FOR A MAXIMUM SIGNAL. REPEAT THIS PROCEDURE FOR ALL OTHER CHANNELS BEING TUNED.

FOR THE RECEIVER TO OPERATE PROPERLY, THE ANTENNA LOADING COIL LEADS MUST BE CONNECTED TO THE LOADING COIL.

TO AVOID TUNING THE RECEIVER TO THE IMAGE, TUNE FOR MAXIMUM VOM READING ON THE PEAK CLOSEST TO MAXIMUM CAPACITY (FULLY CLOCKWISE) WHEN THE RECEIVER CRYSTAL FREQUENCY IS ABOVE THE CHANNEL FREQUENCY; AND ON THE PEAK CLOSEST TO MINIMUM TRIMMER CAPACITY (FULLY COUNTERCLOCKWISE) WHEN THE RECEIVER CRYSTAL FREQUENCY IS BELOW THE CHANNEL FREQUENCY.

RECEIVER I.F. ALIGNMENT:

IF RECEIVER IF ALIGNMENT IS REQUIRED, THE PROCEDURE SHOULD BE AS FOLLOWS:

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INSTALLATION INSTRUCTIONS CONTINUED ....

INITIAL RECEIVER TUNE-UP: CONTINUED ....

2. RECEIVER I.F. ALIGNMENT: CONTINUED ....

FIRST SET THE CHANNEL SELECTOR CONTROL TO THE B.C. POSITION AND THE B.C. TUNING CONTROL TO 550 KC/S. SECOND, CONNECT THE SIGNAL GENERATOR DIRECT TO THE ANTENNA JACK AND SET THE FREQUENCY TO 455 KC/S. THIRD, PEAK EACH I.F. TRANSFORMER WHILE MAINTAINING A LEVEL FROM THE SIGNAL GENERATOR WHICH IS JUST SUFFICIENT TO GIVE GOOD PEAKING INDICATION.

NOTE: FOR TROUBLE SHOOTING, SEE SERVICE NOTES.

GENERAL SERVICE NOTES

1. F.C.C. REGULATIONS:

THE OPERATORS OF RADIOTELEPHONE EQUIPMENT SHOULD BE FAMILIAR WITH PART 8 OF THE FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS. REMEMBER, THE PRIMARY FUNCTION OF MARINE COMMUNICATIONS EQUIPMENT IS SAFETY TO LIFE AND PROPERTY.

OPERATION OF THIS EQUIPMENT REQUIRES THE TRANSMITTER TO BE LICENSED BY THE F.C.C. AND, IN ADDITION, THE OPERATOR MUST HOLD A VALID RADIOTELEPHONE OPERATOR'S LICENSE OR PERMIT.

AS A REMINDER, THE F.C.C. REQUIRES THE OPERATOR TO MAINTAIN A WATCH ON 2182 KC/S, TO KEEP THE TRANSMISSIONS BRIEF, TO MAINTAIN AN ADEQUATE LOG AND TO PERIODICALLY CHECK HIS TRANSMITTING FREQUENCIES.

2. D.O.T. REGULATIONS:

THE OPERATORS OF RADIOTELEPHONE EQUIPMENT SHOULD BE FAMILIAR WITH THE MARITIME SERVICES REGULATIONS AS PUBLISHED BY THE DEPARTMENT OF TRANSPORT. RADIOTELEPHONE EQUIPMENT INSTALLED ON BOARD ANY VESSEL MAY ONLY BE OPERATED BY PERSONS HOLDING AN APPROPRIATE CERTIFICATE OF PROFICIENCY IN RADIO. IN MOST INSTANCES A RADIOTELEPHONE OPERATOR'S RESTRICTED CERTIFICATE WILL SUFFICE.

ALL RADIO STATIONS INSTALLED ON BOARD CANADIAN VESSELS ARE REQUIRED TO BE LICENSED. THIS LICENSE MUST BE POSTED IN A CONSPICUOUS PLACE NEAR THE EQUIPMENT.

SHIPS VOLUNTARILY FITTED WITH RADIOTELEPHONE SHOULD ENDEAVOUR TO KEEP WATCH ON 2182 KC/S TO THE GREATEST PRACTICABLE EXTENT AT SEA. IT IS ALSO MANDATORY TO MAINTAIN AN ADEQUATE LOG OR DIARY.

3. BATTERY SUPPLY:

THE INPUT POLARITY OF ALL MARCONI RADIOTELEPHONES MUST BE OBSERVED FOR PROPER OPERATION, BUT NO DAMAGE WILL RESULT IF THE LEADS ARE ACCIDENTALLY REVERSED.

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GENERAL SERVICE NOTES CONTINUED ....

3. BATTERY SUPPLY: CONTINUED ....

THE MINIMUM AND MAXIMUM OPERATING VOLTAGES FOR THIS EQUIPMENT ARE 11 TO 16 VOLTS. FOR MARCONI RADIOTELEPHONES DESIGNED FOR 32 VDC, MINIMUM AND MAXIMUM OPERATING VOLTAGES ARE 29 TO 40 VOLTS. VOLTAGES ABOVE THESE RANGES CAN CAUSE PERMANENT DAMAGE TO THE UNIT.

THE CURRENT REQUIREMENTS ARE AS FOLLOWS:

	RECEIVE	STANDBY	TRANSMIT
CN414-2	.175 A	1.35 A	7.6 A
CN438-2	.65 A	1.65 A	10.8 A
CN495-2	.6 A	1.6 A	22.0 A

4. ELECTRICAL INTERFERENCE:

ONCE THE RADIOTELEPHONE HAS BEEN INSTALLED AND IS OPERATING, START THE MOTORS AND LISTEN FOR NOISES WHICH SEEM TO BE IN TIME WITH THE IGNITION SYSTEM'S GENERATOR OR ANY OTHER ELECTRICAL EQUIPMENT ON BOARD. IF THESE NOISES ARE UNDULY TROUBLESOME, WE SUGGEST THE FOLLOWING STEPS BE TAKEN TO HELP REDUCE THE INTERFERENCE:

A) ON MOTORS WHICH USE AN AUTOMOTIVE TYPE GENERATOR, A 1 MICROFARAD, FEED THRU CONDENSER SHOULD BE INSTALLED DIRECTLY ON THE ARMATURE TERMINAL OF THE GENERATOR, WHICH IS USUALLY MARKED ARM.

B) A SIMILAR CONDENSER CAN BE INSTALLED ON THE BATTERY SIDE OF THE VOLTAGE REGULATOR.

C) SUPPRESSOR RESISTORS CAN BE INSTALLED ON THE DISTRIBUTOR (INCLUDING LEAD GOING TO IGNITION COIL).

5. RECEIVER TROUBLE SHOOTING:

1. VISUAL INSPECTION; CHECK ALL LEADS TO THE RECEIVER BOARD FOR BROKEN CONNECTIONS. CHECK ALL COILS FOR OPEN OR BROKEN LEADS.

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GENERAL SERVICE NOTES CONTINUED ....

5. RECEIVER TROUBLE SHOOTING: CONTINUED ....

2. D.C. VOLTAGES; CHECK ALL DC VOLTAGES AGAINST THOSE INDICATED ON CIRCUIT DIAGRAM. WHEN A DEVIATION OF MORE THAN 20% IS NOTED, CHECK COMPONENTS ASSOCIATED WITH THAT TEST POINT BEFORE REPLACING THE TRANSISTOR.

3. A.C. VOLTAGES; CAPACITY COUPLE THE SIGNAL GENERATOR WHEN SIGNAL TRACING AND OBSERVE STANDARD PROCEDURE FOR SUPERHETRODYNE RECEIVERS.

NOTE A): ALL MEASUREMENTS OF STEPS 1 AND 3, WERE TAKEN WITH A 20,000 OHM PER VOLT VOM AND WITH THE ANTENNA DISCONNECTED. (NO SIGNAL INPUT). THE SQUELCH AND NOISE LIMITER CONTROLS SHOULD BE IN THE OFF POSITION.

NOTE B): TO DEACTIVATE THE SQUELCH CIRCUIT COMPLETELY, TURN SQUELCH CONTROL FULLY COUNTERCLOCKWISE.

NOTE C): DO NOT REMOVE OR REPLACE TRANSISTORS WITH POWER TURNED ON.

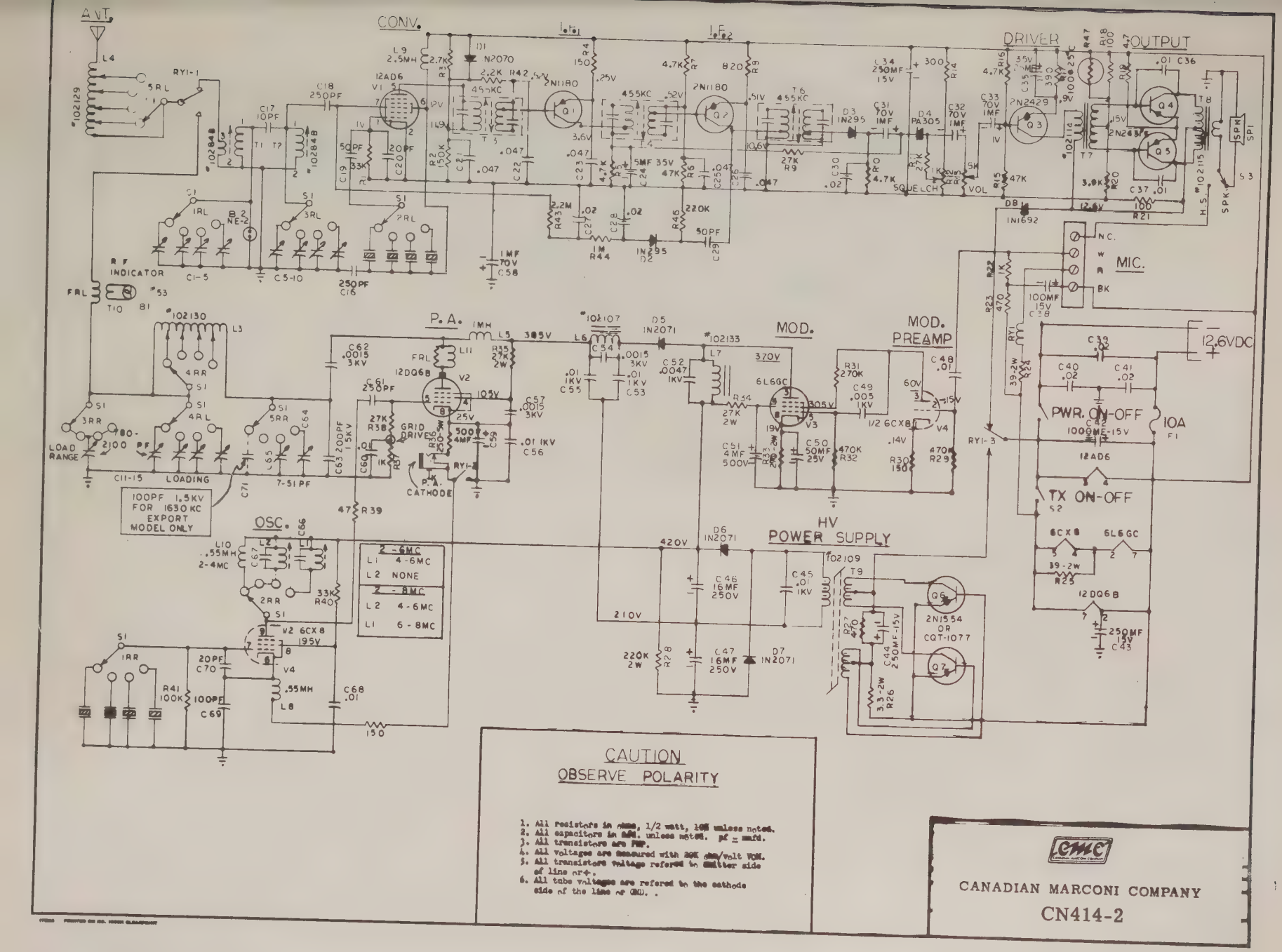
6. TRANSMITTER TROUBLE SHOOTING:

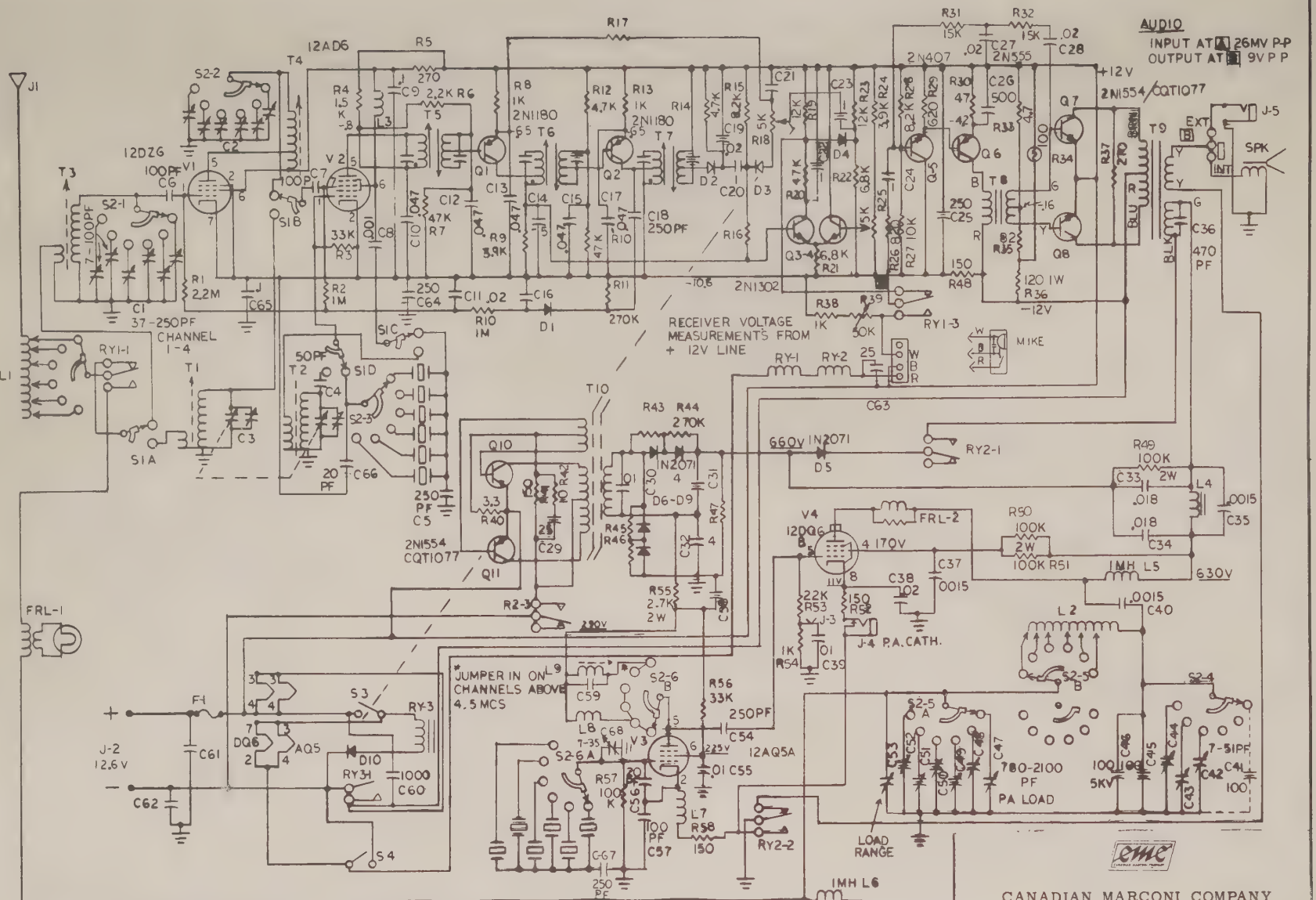
1. CHECK FOR PROPER OPERATION OF D.C. TO D.C. CONVERTER BY MEASURING THE SECONDARY B+ VOLTAGES AGAINST CIRCUIT DIAGRAM. A SHORT ON THE SECONDARY WILL CAUSE THE D.C. TO D.C. CONVERTER TO STOP FUNCTIONING.

2. CHECK FOR PROPER TUBE VOLTAGES OF THE OSCILLATOR AND R.F. AMPLIFIER TUBES, AGAINST THOSE INDICATED ON THE CIRCUIT DIAGRAM.

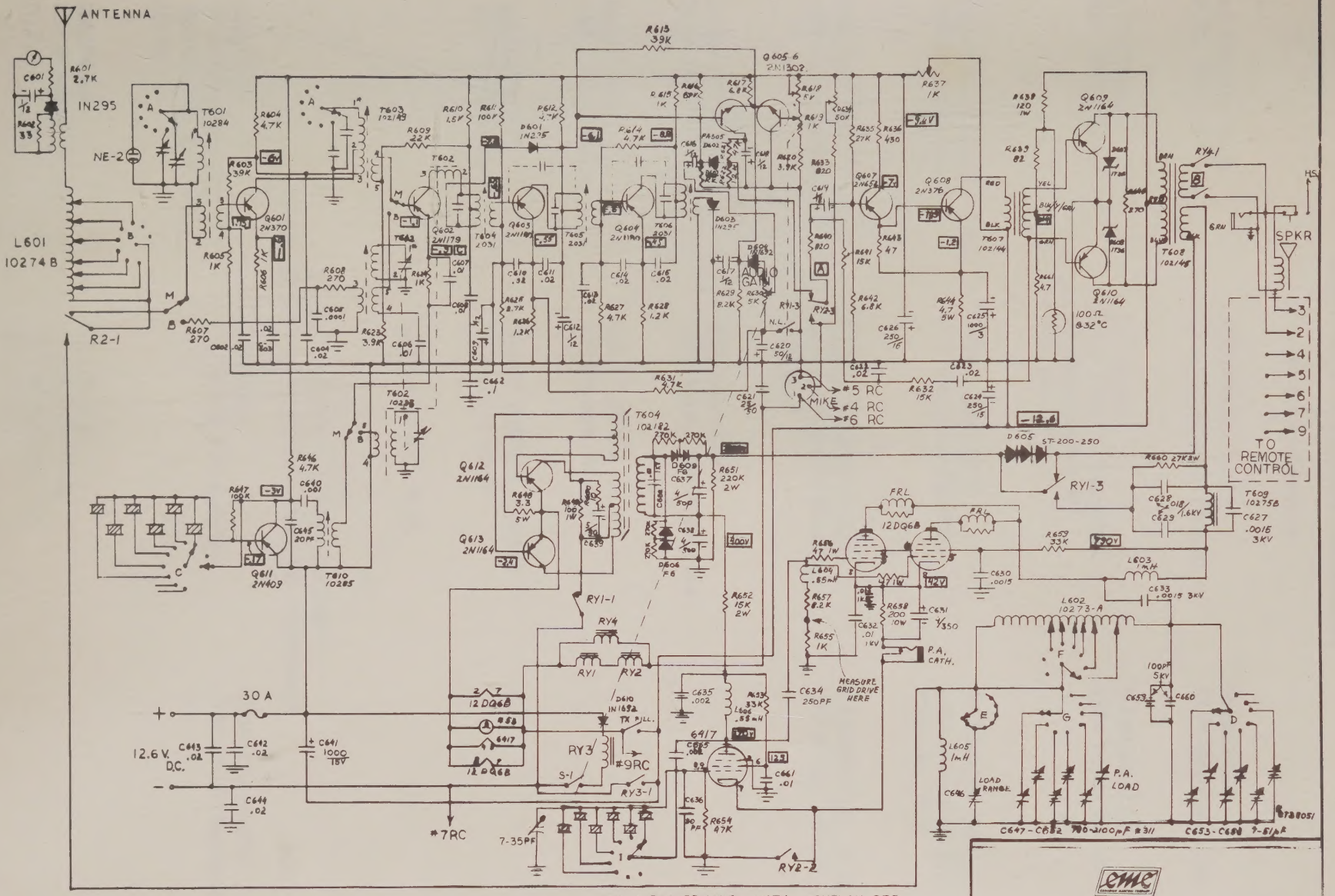
3. ALL VOLTAGES IN THE R.F. SECTION ARE MEASURED WITH RESPECT TO THE CHASSIS.

	RECEIVE	STANDBY	TRANSMIT
CN414-2	.175 A	1.35 A	7.6 A
CN438-2	.65 A	1.65 A	10.8 A
CN495-2	.6 A	1.6 A	22.0 A


ANT.
CONV.
I.F.1
I.F.2
DRIVER
OUTPUT
P.A.
MOD.
MOD. PREAMP
OSC.
HV POWER SUPPLY
MIC.
PWR. ON-OFF
TX ON-OFF
10A
12.6VDC
RF INDICATOR
LOAD RANGE
LOADING
P.A. CATHODE
GRID DRIVE
SQUELCH
VOL
100PF 1.5KV FOR 1630 KC EXPORT MODEL ONLY
2 - 6MC
L1 4-6MC
L2 NONE
2 - 8MC
L2 4-6MC
L1 6-8MC
CAUTION
OBSERVE POLARITY
1. All resistors in ohms, 1/2 watt, 10% unless noted.
2. All capacitors in mfd. unless noted. pf = mmfd.
3. All transistors are PNP.
4. All voltages are measured with 20K ohm/volt VOM.
5. All transistors voltage refered to emitter side of line or ⏚.
6. All tube voltages are refered to the cathode side of the line or GND.
CANADIAN MARCONI COMPANY
CN414-2



1. ALL CAPACITORS IN MFD UNLESS NOTED. ALL RESISTORS IN OHMS UNLESS NOTED. BAND SWITCH IN CHANNEL 1 POSITION.
2. ALL MEASUREMENTS WITH SQUELCH OFF. USE A 20K/VOLT VOM. TRANSMITTER MEASUREMENTS WITH RESPECT TO CHASSIS.
3. FOR COVERAGE TO 1600KC ADD C41 TO POSITION 1 ON S2-4.



ALL CAPACITORS IN MICRO-FARAD, UNLESS NOTED.
ALL RESISTORS IN OHMS UNLESS NOTED.
(OPTIONAL REMOTE CONTROL CONNECTIONS SHOWN)

ALL MEASUREMENTS WITH SQUELCH OFF
USE 20000 OHMS/VOLT D.C. METER
INPUT AT A 7mW P.P.—OUTPUT AT B 11.5 V.P.P.
OSCILLATOR INJECTION AT C BC - 19 V.P.P.
MAR - 12 V.P.P.

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